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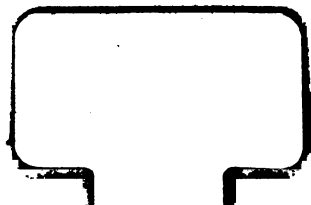
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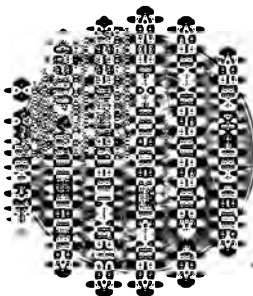




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LETTER OF TRANSMITTAL.

To the Honorable Members of the Senate and Assembly of the Legislature of California.

GENTLEMEN :

Pursuant to the requirements of section 2319 of the Political Code of the State of California, under "An Act Relating to the State Commissioner of Horticulture," approved April 25, 1911, I herewith submit for your consideration a financial statement covering the sixty-fourth and sixty-fifth fiscal years, a report of the horticultural condition of the state, of the service and status of the county horticultural commissioners for the past two years and the work of the several divisions of this Commission, together with a brief statement of the needs and requirements for the sixty-seventh and sixty-eighth fiscal years, with recommendations.

A. J. COOK,
State Commissioner of Horticulture.

E. J. VOSLER,
Secretary, State Commission of Horticulture.



SIXTH BIENNIAL REPORT OF THE STATE COMMISSIONER OF HORTICULTURE.

STATEMENT OF EXPENDITURES.

Sixty-fourth Fiscal Year.

Main Office.

Commissioner, deputy commissioner, secretary, clerk, stenographer and janitor.	
Salary	\$1,494 08
Supplies and equipment	1,630 43
Traveling	1,664 14
	<hr/> \$4,788 65

Insectary Division.

Superintendent, assistant superintendent, field deputy, stenographer and janitor.	
Salary	\$1,480 00
Supplies and equipment	881 46
Traveling	707 15
Extra help	62 50
	<hr/> \$3,131 11

Quarantine Division.

Chief deputy quarantine officer, deputy quarantine officer, 7 inspectors and clerk.	
Salary	\$10,339 17
Supplies and equipment	451 12
Traveling	1,197 26
Office rent	360 00
Reporting vessels	162 05
Extra help	27 75
	<hr/> \$12,537 35

Pathological Division.

Plant pathologist.	
Salary	\$2,425 00
Supplies and equipment	255 28
Traveling	334 18
Extra help	124 93
	<hr/> \$3,139 39

General Expenses.

Telephone and telegraph	\$475 28
Express, freight and cartage	494 68
Revolving fund increased (amount raised from \$250 to \$500)	250 00
Revolving fund (postage)	1,471 00
Library (new books)	189 36
Mediterranean fruit fly campaign (Hawaii)	1,416 82
White fly campaign (Marysville)	426 59
Painting State Insectary	105 00
Services state quarantine guardians	47 50
Oil burner equipment and boiler for State Insectary	479 75
Miscellaneous	277 95
Special trips:	
Portland, Nurserymen's Convention (commissioner)	56 50
Utah, alfalfa weevil investigation (chief deputy)	112 15
Spokane, Northwest Inspectors' Association (secretary)	98 15
Washington, D. C., Mexican orange maggot investigation (commissioner)	200 30

Total expenditures	\$29,697 53
Amount appropriated for sixty-fourth fiscal year	\$27,500 00
Balance unexpended for sixty-third fiscal year	3,273 21
Amounts returned to appropriation:	
1912, January 23d, postage	56 53
April 15th, express	30 00
Amount on hand for sixty-fourth fiscal year	\$30,859 74
Expenditures for sixty-fourth fiscal year	<hr/> 29,697 53

Balance for sixty-fourth fiscal year	\$1,162 21
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Amounts returned to general fund from sixty-fourth fiscal year appropriation:

1912, October 8th, scrip book rebate.....	\$11 35
1913, June 25th, scrip book rebate.....	4 03
June 30th, postage refund.....	43 63
July 23d, revolving fund.....	500 00
October 21st, refund on claim.....	5 57
Balance sixty-fourth fiscal year.....	1,162 21

Total returned to general fund..... \$1,726 79

Sixty-fifth Fiscal Year.

Main Office.

Commissioner, deputy commissioner, secretary, assistant secretary, clerk, stenographer and janitor.

Salary	\$2,530 00
Supplies and equipment.....	1,018 66
Traveling	1,535 62
	\$5,084 28

Insectary Division.

Superintendent, assistant superintendent, field deputy, stenographer and janitor.

(a) Sacramento office:

Salary	\$1,124 00
Supplies and equipment.....	684 28
Traveling	707 53
	\$2,515 81

(b) Insect collecting, Mediterranean region, work commencing March, 1914, Mr. Henry L. Viereck in charge:

Salary	\$666 64
Traveling	417 76
Miscellaneous expenses	188 85
	\$1,273 25

Quarantine Division.

Chief deputy quarantine officer, deputy quarantine officer, 8 inspectors and clerk.

Salary	\$10,800 00
Supplies and equipment.....	154 50
Traveling	1,040 86
Office rent	360 00
Reporting vessels	156 00
Extra service	19 00
	\$12,530 36

Pathological Division.

Plant pathologist and assistant, work discontinued August 31, 1913.

Salary	\$500 00
Supplies and equipment.....	62 14
Traveling	126 89
	\$689 03

General Expenses.

Telephone and telegraph	\$347 24
Express, freight and cartage.....	428 66
Library (new books).....	44 82
Revolving fund created.....	500 00
Revolving fund (postage).....	854 00
Services State Quarantine Guardian.....	200 05
Forty-fourth State Fruit Growers' Convention (Davis).....	22 71
Insect collections in Orient (superintendent insectary).....	1,008 99
Miscellaneous expenses	109 37

Total expenditures \$25,608 57

OFFICERS OF THE CALIFORNIA STATE COMMISSION OF HORTICULTURE, DECEMBER, 1914.

EXECUTIVE OFFICE.

Capitol Building, Sacramento.

A. J. Cook	Commissioner
G. P. Weldon	Chief Deputy Commissioner
E. J. Vosler	Secretary
Miss Maude Hiett	Clerk
Mrs. N. Mitchell	Stenographer
O. W. Newman	Office Assistant

INSECTARY DIVISION.

Capitol Park, Sacramento.

Harry S. Smith	Superintendent
Henry L. Viereck	Assistant Superintendent
E. J. Branigan	Field Deputy
Mrs. E. Stephens	Stenographer

QUARANTINE DIVISION.

San Francisco Office: Room 11, Ferry Building.

Frederick Maskew	Chief Deputy Quarantine Officer
George Compere	Chief Quarantine Inspector
B. B. Whitney	Quarantine Inspector
L. A. Whitney	Quarantine Inspector
Archie Chatterley	Quarantine Inspector
Stewart Chatterley	Quarantine Inspector
Miss Clare Dutton	Stenographer and Clerk

QUARANTINE DIVISION.

Los Angeles Office: Floor 9, Hall of Records.

A. S. Hoyt	Deputy Quarantine Officer
C. H. Vary	Quarantine Inspector
L. A. Strong	Quarantine Inspector

QUARANTINE DIVISION.

San Diego Office: Courthouse.

H. V. M. Hall	Quarantine Inspector
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A succinct tabulated statement of the principal activities of the several divisions of the Commission:

MAIN OFFICE.

1. Publication of The Monthly Bulletin.
2. Crop reports and orchard statistics.
3. Work of chief deputy.
4. White fly campaign.
5. Alfalfa weevil inspection.
6. Correspondence.
7. Lectures.
8. Insect control.
9. State Fruit Growers' conventions.
10. Emergency convention—mealy bug.
11. Emergency convention—potato.
12. Melanose quarantine.
13. Special monographs.
14. Mails—parcel post.

HORTICULTURAL STATUS OF CALIFORNIA.

The year 1913 closed a period of prolonged drought, and as a result the grain and hay crops and also the fruit production in unirrigated areas were considerably below the average, but the high prices often more than made up for the deficient crops. Last year alfalfa sold for \$12 per ton, whereas this year it is difficult to secure \$7.

The frost in early January, 1913, was a serious blow to the citrus industry. Not only was much fruit destroyed, but also the trees were often greatly damaged or killed outright. In some sections where no destructive freeze had ever occurred before, heavy loss was sustained. Strange to say, these sections were often in the very southern limits of the state; indeed, the north suffered less by far than did the south. Many of the growers had provided equipment to fight the frost and thus saved both fruit and trees, and the high prices of fruit consequent upon the diminished supply secured to these provident fruit growers large returns for their output. The superior marketing system of the south and the high prices received for the fruit did much to compensate for the great loss caused by the freeze.

The lessons of the freeze are many and are not likely to be forgotten: *First*, "There are no frostless areas in California"; *second*, oil pots or other equipment are a *sine qua non* in California citrus culture; *third*, a good heating system with sufficient oil and help available upon call will certainly protect against the lowest temperature ever yet known in the citrus belt; *fourth*, the loss from severe cold is in inverse proportion to the amount wisely spent in securing heating apparatus, and lastly, the man who has the proper equipment to resist the frost damage may find the cold a very substantial friend.

The almonds also suffered severely by cold weather in spring. In some places one half or more of the crop was lost.

The ample rains of the winter 1913-1914 produced very large crops this present season. Except for prunes, I think this was generally true. Of course, low prices have resulted, although doubtless on the whole the past season may be considered a favorable one for the ranchers of the state.

By studying the orchard statistics in The Monthly Bulletin published by this Commission it will be seen that the annual plantings are enormous. This fact leads some of our people to wonder how we shall be able to market our greatly increased production in the distant future. The same wail was heard years ago when we marketed less than twenty thousand carloads of citrus fruit. The cry was raised: "We have reached the utmost possibilities of the market." We now ship more than double the amount sent from our orchards at that time, yet there were far more "red ink returns" then than now. With our improved methods, better knowledge and keener attention to marketing, the wide-

awake rancher need fear no bar to success. The worst possible result will be the elimination of the heedless, slip-shod farmer, which certainly would be no loss to the great fruit industry.

It is worthy of note that large citrus orchards are now being planted as far north as Tehama County, while avocados, rice, cotton and date production are claiming more and more attention and bid fair to be important in the future agriculture of the state.

More and more our farmers are acting on the belief that insect control must not be neglected; that to combat fungi with the best sprays and spray outfits is to court success; that deep, ample cultivation pays enormous profits; that wise and timely use of water pushes failure to the wall; that stable fertilizer and cover crops in large full measure insure a large full bank account, and that nitrogen—especially organic nitrogen—like dried blood and tankage, gives big orchard and field returns, although as yet the use of potash and the phosphates gives no certain proof of value.

COUNTY COMMISSIONERS OF HORTICULTURE.

Our state was first to organize fully to give advice and exercise the function of general quarantine and insect and fungus control. In 1911 the old law providing for a board consisting of three horticultural commissioners in each county gave way to the far better system of a single commissioner. The several commissioners, having served each four years, have for the most part qualified anew by taking a more rigid examination and have generally been reappointed. A few have been promoted and so are lost to the service. Perhaps some have been weeded out as unfit. I think politics has had little to do with any changes which have occurred. For the most part the services of these officials are appreciated, as they well may be. Many of the inspectors serving under the commissioners have taken the examination and have usually passed with a high rank. In one county all of the inspectors, five in number, qualified as eligibles for the commissionership.

These county horticultural commissioners are faithful, earnest, capable men; they have become skillful in the use of control measures, apt in quarantine and by hard study are exceptionally well prepared to advise. This education has been gained at the expense of the several counties, and added to the natural adaptation has become a valuable asset, not only to the counties, but also to the state as well. Thus we must felicitate the various counties on the fact that these men have been so generally reappointed.

It is to be regretted that every county producing fruit or dealing in fruit or plants and trees has not a county horticultural commissioner. The counties of San Francisco, Marin, San Mateo and San Luis Obispo are at present without county horticultural commissioners. This lack is a real menace to the counties themselves and a danger point which

threatens the safety of the entire state. San Francisco, because of its large shipments of fruit and nursery stock, is in special need of such an official. The present law provides that upon the reception of a petition from certain specified citizens the board of supervisors shall immediately call for an examination of candidates for the position of county horticultural commissioner. Those who pass this examination are eligible for the position. These are reported to the supervisors, who shall within thirty days appoint a county horticultural commissioner. The supervisors of San Francisco, San Mateo and San Luis Obispo counties have each and all received such a petition. San Francisco and San Luis Obispo counties have refused to act at all in the matter, while San Mateo asked for an examination, but made no appointment from the list of eligibles submitted. The attorney general informs me that it is neither my duty nor is it his to compel action. The nurserymen, fruit vendors and others interested, not wishing to excite the ill-will of the supervisors, hesitate to bring action, and the welfare and safety of each county in the state are placed in jeopardy. Could not the law be so changed that the attorney general shall be compelled to take action where the law is unheeded?

Six other counties, Plumas, Mono, Amador, Calaveras, Tuolumne and Mariposa, are without supervision. Each one of these is commencing to plant orchards, and there is good promise of success. Their limited size results in inaction, and so each county is a danger point in the state. Each one of these counties might be united with its nearest neighboring county, thus forming a district with a single commissioner for the two. Thus Mono could be combined with Inyo, Amador with Sacramento, Plumas with Lassen, Calaveras with San Joaquin, etc. There is every reason why this legislation should be hastened. Local and state safety pleads for it.

At present each commissioner is a county officer, appointed by the supervisors, so politics may be influential in the selection of this official, and besides the supervisors are not competent in many cases to select wisely. The state commissioner of horticulture should be the party to perform this service, which would remove both of the above objections. Then all appointments would be under civil service rules, and the commissioners would be state officials, paid by the state. There is much to recommend this, and as state expenses are not met by direct taxation there seems little objection to the change.

Again, each county board of supervisors can at the suggestion of the county horticultural commissioner pass an ordinance, which is in effect a law as binding as any law, in case it does not conflict with a state law. As we have forty-three county horticultural commissioners, we may have as many county ordinances regarding the shipment of a single plant or tree; indeed, there are several such laws affecting intercounty shipments

of grape vines. Such diverse laws are a serious handicap upon trade, and of course are not only embarrassing but a great hardship upon all of our nurserymen and upon the would-be orchardist as well. Uniform horticultural laws throughout the state are imperative to successful business. These changes in the law are greatly needed, but should not displace our present able corps of county horticultural commissioners.

THE MONTHLY BULLETIN.

One of the activities of the Commission is the publication of The Monthly Bulletin, edited by the secretary. If expressions of approval from very many of its readers are to be trusted, this publication fills a real want. It is only sent out upon personal application, yet its rapid increase in circulation is startling. The aim of the bulletin is to give information that is virile, fresh and severely practical. Nearly all of the State Fruit Growers' conventions have given hearty and unanimous approval to this publication, and have urged its continuance. At the recent convention in Los Angeles, where over thirteen hundred persons registered, it was unanimously voted that the publication of The Monthly Bulletin be continued and financed by the state, even though this result in the cessation of the publication of the convention reports by the state.

CROP REPORTS AND ORCHARD STATISTICS.

Not only The Monthly Bulletin but also the monthly crop reports and annual orchard statistics, published regularly in The Monthly Bulletin, are new features of the work of the State Commission of Horticulture. Statistics to be valuable must be accurate. If inaccurate, they are misleading and do serious harm. We have at our command hundreds of trained, able men daily in the fields and orchards. These county horticultural commissioners, their deputies and inspectors form a corps of census collectors unequaled anywhere. We are not only equipped to do this work exceptionally well, but we are doing it in a way to command the respect of the public. Our statistics are much sought after. Would it not be wise to include field and truck crops in these reports, as this could be easily done? The convention recently held at Los Angeles thought so, as in speaking of statistics it passed the following resolution unanimously:

WHEREAS, The State Commission of Horticulture is in position, through cooperation with the County Horticultural Commissioners, to gather this data more accurately and cheaply than any other organization,

Be it resolved, That we recommend to the California state legislature that the work of the state statistician be placed under the State Commission of Horticulture, and that the appropriation now granted for the compilation of data as mentioned above be attached to the Commission's office for this purpose.

This gathering of statistics is in charge of the Chief Deputy Commissioner of Horticulture, whose ability, training and experience fit him so well for the work that the statistics are becoming increasingly valuable.

WORK OF CHIEF DEPUTY.

I wish to call your attention to the work of the Chief Deputy. This officer might well be called "Field Deputy." The position is important, but although a statutory office, it was never filled until the present administration took up the work. It is the duty of the Chief Deputy to visit as adviser the several county horticultural commissioners and to cooperate with them in perfecting the quarantine and control work. He also gives field demonstrations and lectures. The present Chief Deputy has written a valuable treatise on the apple. He was appointed from Colorado, where he had gained a wide reputation for his excellent work of kindred nature in that state. His admirable service here has secured to him general recognition. He has had thorough training as well as extended practical experience in entomology, plant pathology and general horticulture, and is a real acquisition to the Commission.

WHITE FLY CAMPAIGN.

The white fly menace at Marysville still continues. We hope to eradicate the pest, but as yet we have only been able to hold it in control. We shall continue the fight, hoping to exterminate this dreaded destroyer. If this hope prove vain, we shall work in conjunction with the county horticultural commissioner of Yuba County with all diligence and energy that the evil spread no further. This white fly fight was ably prosecuted by my predecessors at an expense of about \$10,000. We have spent about \$600, and as indicated above, the end is not yet. It is significant that this pest probably came to our state through the mails.

ALFALFA WEEVIL.

This destructive insect enemy of our great forage crop which has done such frightful damage in Utah and which has gained entrance into Idaho and Wyoming, where it is spreading, has not yet invaded our state, as by our strict quarantine and close attention we have kept it at bay thus far. We are more than ever hopeful that we will continue to do so. We sweep the alfalfa fields contiguous to the transcontinental railroads extending from Utah to California with a hand net each season. By this precaution we hope and expect to discover its first appearance should it reach our state, when by very drastic and strenuous measures we shall endeavor to extirpate the insects before they are widely dispersed, in which case it would be quite impossible to do so. In that event the damage would be great and continuous, and the loss to the state would be alarmingly large. Our motto is "extreme vigilance," for this alone will insure safety.

CORRESPONDENCE.

The correspondence of the several divisions of the Commission is large, often over fifty letters a day being received. By far the largest portion

of these relates to insects and fungi and their control. With our present able corps of assistants and our equipment we are almost always able to identify these enemies and give advice at once. Very rarely does a letter go over night unanswered.

LECTURES.

Reference has already been made to the lectures given by the Chief Deputy. The Commissioner is very often called upon to lecture as are other members of the staff. The former has lectured in all more than one hundred times and in nearly all the fruit-growing counties of the state. Inyo and Humboldt are the only counties omitted. Several invitations to these counties could not be accepted because of distance and lack of time. In some of the larger counties the number of lectures has reached as high as seven or eight. The Chief Deputy has advised with the county horticultural commissioners in every county; in several counties two or three times, and he has lectured altogether more than a score of times. This service seems to be appreciated, and we believe it is valuable.

INSECT COLLECTION.

Our insect collection is of signal value. It enables us to give quick and certain identification of almost any insect received. This collection is accurately named, and now numbers thousands of species. It has all been collected and arranged in the three years of this administration and is an invaluable adjunct to our work.

STATE FRUIT GROWERS CONVENTION.

In the last two years we have held three regular State Fruit Growers conventions, one at San Jose, another at Davis at the University Farm and the last at Los Angeles. If we may judge by the attendance and evident interest, these conventions are greatly appreciated. At the Davis convention over eight hundred registered, and without doubt many in attendance failed to register. At the Los Angeles convention over thirteen hundred registered.

These annual and semi-annual meetings have been conducted with no little enthusiasm since 1881, and the lectures and discussions have been published with but two exceptions by the state for free distribution until the San Jose convention, held in December, 1913. We had no funds to publish the proceedings of that convention nor yet of the Davis and Los Angeles conventions and keep up the publication of The Monthly Bulletin and issue a second edition of the work on "Injurious and Beneficial Insects," which was loudly called for. Of course we decided to omit the publication of the convention reports, but we have, however, arranged to issue the report of the Los Angeles convention with no expense to the state. As the more important papers read at the conventions appear in The Monthly Bulletin from time to time and in the vari-

ous agricultural and horticultural papers, this failure to publish by the state is not so great a loss as would at first appear. We found that to issue a report of the Davis meeting alone would cost the state more than \$3000. In the estimate handed to the State Board of Control for funds for the support of this Commission during the sixty-seventh and sixty-eighth fiscal years no provision was made for the publication of the convention reports. If it is thought that these reports should be issued as in the past, the appropriation for printing must be increased accordingly.

EMERGENCY CONVENTIONS.

During the present year there have been held two emergency conventions, one on the mealy bug at Ontario and the other on the potato at Stockton. The first was called because of an invasion by the mealy bug in several orchards at Upland, causing serious losses. The citrus growers were anxious, not to say alarmed. The convention gave information that largely quieted fears and in a sense solved the problem. It was voted at this convention that this Commission prepare and publish a comprehensive report on the subject, which appeared in The Monthly Bulletin of March, 1914. The potato convention came as a result of quarantine action taken by Idaho and British Columbia against California potatoes because of the presence in our state of the tuber moth, an insect destructive to the potato. This quarantine was extended practically by Oregon and Washington, where whole carloads of California potatoes were destroyed. This convention was attended by experts from Europe and the United States Department of Agriculture. It developed that the potato industry was suffering severely from insect and fungoid attack, which could be successfully resisted. The information gained at this meeting was very assuring. Action was taken towards the formation of the West Coast Potato Association, including California, Nevada, Utah, Idaho, Oregon, Washington and British Columbia. Later the association was fully organized, and it is believed that in creating a better interstate understanding and securing better cultural methods great good will accrue to our state.

MELANOSE QUARANTINE.

Owing to the severe freeze in January, 1913, pomeloes were shipped into California from Florida in large quantities. They were all rigidly inspected by our quarantine staff, and we at once became aware of a serious fungous disease affecting this fruit. This disease is known as "melanose," or "stem-end rot," and once established in the groves of California would be a serious handicap to our great citrus industry. We at once placed an absolute quarantine on citrus fruit from Florida and the Island of Porto Rico on account of melanose. Of late there has developed another virulent fungous disease affecting the citrus in the gulf states known as "citrus canker." Happily the quarantine regu-

lations already established against these states will protect us against this new enemy of the citrus growers.

SPECIAL MONOGRAPHS.

When I assumed the duties of this office I found very few treatises on the care and culture of the many fruits grown in California. Almost every mail brought requests for such information. We have secured and published reliable up-to-date treatises prepared by successful growers on alfalfa, the almond, apricot, date, peach, pear, plum, prune, walnut, avocado and citrus fruits, and have now in the press a treatise on the apple. Our correspondence convinces us that this part of our work is appreciated.

In February, 1913, we issued an unusually large edition of "Injurious and Beneficial Insects of California," prepared by our then secretary, as we expected that there would be a great demand for the publication. Our expectation was greatly exceeded. In a few months the supply was exhausted. Some of the leading authorities in entomology congratulated us on the preparation of "the best work of the kind ever published." Scores of requests have been received and placed on file awaiting the issue of a second improved edition nearly ready for distribution.

BACTERIA AND FUNGI.

Before I ever thought of accepting the position I now hold I felt the crying need of more knowledge regarding these unspeakable enemies of the orchardists, destructive bacteria and fungi. The loss from these pernicious foes is alarming. Though funds were scant, the State Board of Control consented to the employment of a mycologist. I knew of the excellent work of Prof. H. S. Fawcett in the citrus groves of Florida and hastened to secure his services. He accepted the position and was stationed at Whittier, commencing his research work at Chula Vista, Santa Paula and Whittier. He was given every assistance at each place and soon discovered, actually demonstrating, the cause and cure of lemon gummosis, which is decidedly the most destructive disease of the lemon known to our citrus growers. This disease has robbed our orchardists of hundreds of thousands of dollars. In The Monthly Bulletin of August, 1913, Professor Fawcett explained the cause and cure of this disease in an illustrated article. We did not have funds to retain the services of a mycologist if we carried on the parasitic work, as I felt we must do, and I also believed that such research work could be more economically performed at the State University and that it properly belonged there. I therefore proffered the services of Professor Fawcett to the university authorities on the condition that he be retained exclusively in the field of investigation for which he had proved himself so admirably fitted. It hardly need be said that the proffer was immediately accepted.

THE STATE INSECTARY.

California is almost unique among the states in the way she wages war on insects injurious to agriculture. We are not satisfied with spraying and fumigation alone; we recognize their value (without them the citrus industry would now be impossible), but we believe that we should take advantage of every possible opportunity which might give aid in reducing the cost of growing and marketing our fruits. It now costs us more than \$1,000,000 annually to control our insect foes. For these reasons we have the State Insectary, an institution for studying the natural control of insects and the putting to practical use the knowledge thus gained. The work is of an extremely technical nature and requires both training and practical experience by those engaged in its prosecution. An intimate knowledge of the habits and relationships of parasitic and predaceous insects as well as familiarity with the literature treating of the subject is indispensable. There are very few scientists in the world qualified to perform this important service. This fact led us to a very thorough investigation, and we believe we have succeeded in securing a person of exceptional ability in this field of service.

During the past year until the outbreak of the war in Europe an expert entomologist of proved ability was kept in the Mediterranean region searching for promising beneficial insects. Another laboratory was and is maintained in Japan for the same purpose, arrangements having been made with Doctor Kuwana, official entomologist of the Japanese government and a scientist of international repute, to supervise the work. Relations have been established with the government of the union of South Africa, from our standpoint an unexplored region, whereby we have been able through the kindness of Prof. C. P. Lounsbury and of Prof. C. W. Mally to obtain regular sendings of black scale parasites of great promise. California has the benefit of the experience of the three scientists, Messrs. Lounsbury, Mally and Kuwana, absolutely without expense, and the state owes these gentlemen a vote of thanks for the interest they have taken in our welfare.

The promise of securing these beneficial insects from South Africa is so great that we are now placing an assistant in that field. We are also securing the services of a gentleman born in China but educated in our own state, a trained entomologist, who is now a teacher in China, to collect and ship parasites from that great country where citrus fruits have been long grown. We expect much from this section, as Mr. George Compere, who has had such extended observations, feels that China is a very hopeful field for research in this line of work. We are also arranging to exploit the Philippine Islands, where we can secure valuable assistance under the supervision of expert entomologists at a very slight expense. It goes without saying that this work could hardly be carried out without the kindly help of Doctor L. O. Howard, chief of

the Bureau of Entomology, United States Department of Agriculture, Washington, D. C.

The number of species of insects imported during the past two years is considerable, the more promising of which are as follows: Several enemies of the citrus mealy bug from Europe, the best of which seems to be a tiny chalcid, or parasitic fly, called *Leptomastix*. From all reports this parasite is of considerable importance in the control of the mealy bug in Sicily. One colony has been liberated in Southern California, and we are now engaged in breeding additional colonies in the insectary. There occur in Europe two ladybirds, *Chilocorus* and *Exochomus*, which are said to be of considerable value in controlling the black scale. We were unable to obtain a sufficient number for colonizing, but an effort will be made next year to get them introduced. They should thrive in California.

In Japan the mealy bug is greatly checked by natural enemies. We have received a large number of species of parasites from this locality, but for some strange reason they do not thrive on our California mealy bug. Apparently the insect in Japan is a different species from our own, but we are now engaged in trying out the parasites on the Baker and the long-tailed mealy bugs in the hope that we may find these hosts adapted to their habits.

In South Africa we have occupied ourselves entirely with the parasites of the black scale. Messrs. Lounsbury and Mally have sent us so far about a dozen species. Naturally most of them will not prove of great value, but out of the lot we hope to get a few good ones, and our laboratory investigations so far certainly justify our hopes. One of the new species, a small chalcid fly, known to entomologists as *Coccophagus orientalis*, has done wonderful work in the insectary. What gives us great promise from this species is the fact that, unlike *Scutellista*, it breeds upon and destroys the young of the black scale before the latter has an opportunity to lay its eggs. As we have no parasites of importance in California which breed upon this stage of the black scale, it will readily be seen that the introduction of *Coccophagus* will fill an important gap in the natural control of this most damaging of our citrus pests. We have already placed in the field several colonies of this parasite and have found it breeding during the summer. It ought certainly to thrive here, and our efforts will be continued until it becomes thoroughly established. Professor Lounsbury has had the black scale under observation in South Africa for many years and he is responsible for the statement that it is effectually controlled in that country by parasites, except in those restricted localities where the Argentine ant has interfered, so we have reason to feel encouraged over the outlook.

The superintendent of the State Insectary made a hurried trip to the Orient during the latter part of the summer of 1913. Several species of valuable predaceous and parasitic insects were obtained and many important observations made upon the natural control of insects in that region. The most promising species brought to California is a tiny ladybird, *Scymnus bipunctatus*, which feeds upon the mealy bug. It has been introduced into California and is at present breeding in astonishing numbers upon the citrus mealy bug at Alhambra.

We feel that we have been making very satisfactory progress with the work of introducing predaceous and parasitic insects, but the war in Europe has very greatly interfered with its prosecution. In fact, it is necessary to discontinue much of the foreign work on account of delay caused by the chaotic condition of shipping. Delay in the shipment of such insects is fatal.

We have now progressed to a point in our scientific investigations where we feel justified in stating that a great deal of expense can be saved to the California fruit growers by a wise introduction of beneficial insects. The work from now on should be prosecuted with more vigor than ever before. **THERE IS NO REASON WHY THE WORK SHOULD BE DELAYED AND EVERY REASON WHY IT SHOULD BE PUSHED.**

We have made great improvements in the insectary. In fact, it is now one of the best equipped entomological laboratories in the world. We are carrying on the work with as little publicity as possible, as it is necessary to avoid the danger of causing the growers to neglect such matters of control as fumigation and spraying. The plans for the next biennium should include besides the purely research work carried on at the insectary with regard to natural control of insects in general the collection and shipment of material from south Europe, Japan, south-east China, south Africa and possibly from northern South America. These are the regions of greatest promise, and with the large amount of material which we may expect to receive we are bound to obtain results of greatest value to the fruit growers of California.

The fact that we have received several shipments from Europe since the outbreak of the war makes us hopeful that we may continue the work with less certainty, of course, and with somewhat of loss, yet the encouragement which we have received from our success in the last year convinces us we would not be warranted in any cessation of these importations, even though under somewhat trying circumstances.

QUARANTINE DIVISION.

The quarantine division is the most expensive and certainly a very important part of the service rendered by the Commission. The work has increased to an enormous degree, as will be seen by the reports in

The Monthly Bulletin. Except for the thorough organization under the present able Chief Deputy Quarantine Officer, it would be impossible to transact the tremendous volume of inspection required. The long experience and devotion to the work of the entire quarantine force give an efficiency which warrants the compliment extended to it by the chairman of the Federal Horticultural Board, "Well-nigh perfect, the best in the world."

At the suggestion of the writer the entire membership of this corps were made collaborators of the Federal Horticultural Board, which, while this in no way detracts from their usefulness, does give added prestige to their work and greater efficiency to the service.

During the present administration the numerical strength of the force employed in the quarantine division has been practically doubled, and the logical result of this action has been the complete enforcement of the provisions set forth in the state quarantine law as passed by the legislature on January 2, 1912. In support of the foregoing statement the following simple statistics are submitted:

Parcels of horticultural material intercepted, inspected and disposed of at the San Francisco station.

1910.

Fumigated	Refused	Total	Ships Inspected
6,992	750	48,441	253

1913.

29,183	3,150	1,016,807	481
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The records of the Los Angeles and San Diego stations show a like increase in the volume of work, and at these stations, as at San Francisco, an itemized record is kept of each of these transactions and is on file in the several quarantine stations and also at the main office in Sacramento and is available at any time.

The policies of the quarantine division during the period under consideration have been vigorously pursued and have resulted in much permanent benefit. The prime object sought is to eliminate the infestations which constitute the basis for rejection of shipments of plant material at the source of origin. In this effort many avenues have been made use of—publicity in The Monthly Bulletin, conferences with resident consuls, correspondence with inspection officials in foreign countries and the enlistment of the capable cooperation of the active agents employed by the common carriers, both afloat and ashore. The results so far have justified the means made use of, and the material is arriving in cleaner, better condition than ever before.

A perfect working understanding exists between the directors of the Panama-Pacific International Exposition, the prospective exhibitors of horticultural material and the quarantine officers, and the work of installing such exhibits is proceeding with safety to California and satisfaction to the numerous exhibitors.

The counties of San Mateo, San Francisco, Marin and San Luis Obispo, not maintaining county horticultural commissioners, have necessitated in the enforcement of a quarantine the assumption by this division of a large volume of inspection work that properly belongs to the duties of these counties.

The Mediterranean fruit fly, the melon fly, the Mexican orange fly, the alfalfa weevil and the canker and melanose of citrus trees and fruit have been kept from becoming established in the State of California, and all quarantine regulations have been rigorously maintained.

The horticultural laws ought certainly to be so amended that all counties which grow fruit or engage in its sale to any extent should have county horticultural commissioners. There is further reason for this in that the safety of the entire state is jeopardized by the absence of such officers.

MENACE FROM THE PARCEL POST.

There is great danger of our receiving very destructive insect and fungoid pests through the mails, especially since the establishment of the parcel post. An order from the United States Postmaster General requires that all nursery stock, plants and fruit shipped by mail shall bear certificates either from state or government officials declaring that they have been inspected and are free from insect pests and disease. This is largely inoperative, as in most cases there are no persons qualified for this duty and often none at all. Later the order was supplemented by another specifying that any postmaster upon request by an inspection officer might report the fact of any such shipments which had arrived and to whom addressed, yet the law specifically states that any such package must be delivered at once upon its arrival. Of course this requirement makes inspection quite impossible. To search out the numerous packages sent far and wide over the state would require an army of inspectors. What we urgently need and must secure at the very earliest possible date is an order from the Postmaster General, or better, an enactment by Congress requiring that all nursery stock, trees, plants and fruit be sent to one, two or three postoffices in any state requesting such action and that is equipped to make inspection. At these central stations the shipments shall be inspected immediately and forwarded to the addressee if clean and safe, and treated or destroyed in case of infestation, as the condition requires. Such a law has been introduced in Congress and is now awaiting action in the House of Representatives. It certainly should be rushed to speedy passage.

It is thought that the introduction of the white fly at Marysville, Oroville, Sacramento and Bakersfield was through the mails. It has now cost the state nearly \$11,000 in an attempt to eradicate the pest, and it still lingers at Marysville. With the parcel post and its wide patronage the danger is greatly increased. We have intercepted egg masses and even larvæ of the gipsy moth, larvæ and adults of the white flies and many other dangerous insect enemies in the mails. We are gaining very frequent evidence that our mails are a serious menace. "The strength of a chain is its weakest link." The unguarded mailed parcel is the weak link in our otherwise admirable quarantine system. Indeed, may we not look forward hopefully to the time when thorough, efficient inspection may make quarantine no longer necessary? Any legislation that will quicken the pulse of Congress to the effect that it shall require and enforce efficient mail inspection of all nursery stock, trees, plants and fruit is greatly to be desired.

LEGISLATION.

Our horticultural laws are for the most part very excellent. Without doubt they are unsurpassed in efficiency throughout the world, but certain amendments are greatly needed. Every county where fruit is grown or sold in any considerable quantity should have a horticultural commissioner. Ten counties now lack this protection. Again, these officials are county officers appointed by the boards of supervisors. They should be state officials appointed by the State Commissioner of Horticulture under civil service regulations. This would largely eliminate political influence in making appointments and would certainly tend to secure more able county horticultural commissioners. This should, however, not remove the present incumbents as they are picked men who have passed a rigid examination and have been trained in the school of experience at the expense of the several counties and are a valuable asset to the state. These county horticultural commissioners are in the supervision of all intercounty shipments of nursery stock, etc., independent of each other and of the State Commissioner of Horticulture. Thus there is a lack of unity, embarrassment to trade and consequent loss to the state.

The boards of supervisors at the suggestion of the county horticultural commissioners can each frame ordinances which, in case they do not conflict with any state law, become as binding as does a law enacted by the legislature. This makes it possible to have forty-four different laws regarding the same plant, tree or fruit. Indeed, there are now diverse laws in force regarding the same plant. This is a grievous handicap on nurserymen and a serious impediment to trade. The nurserymen have reason to complain, as they do loudly. The growers are injured hardly less than the nurserymen. In case this change in

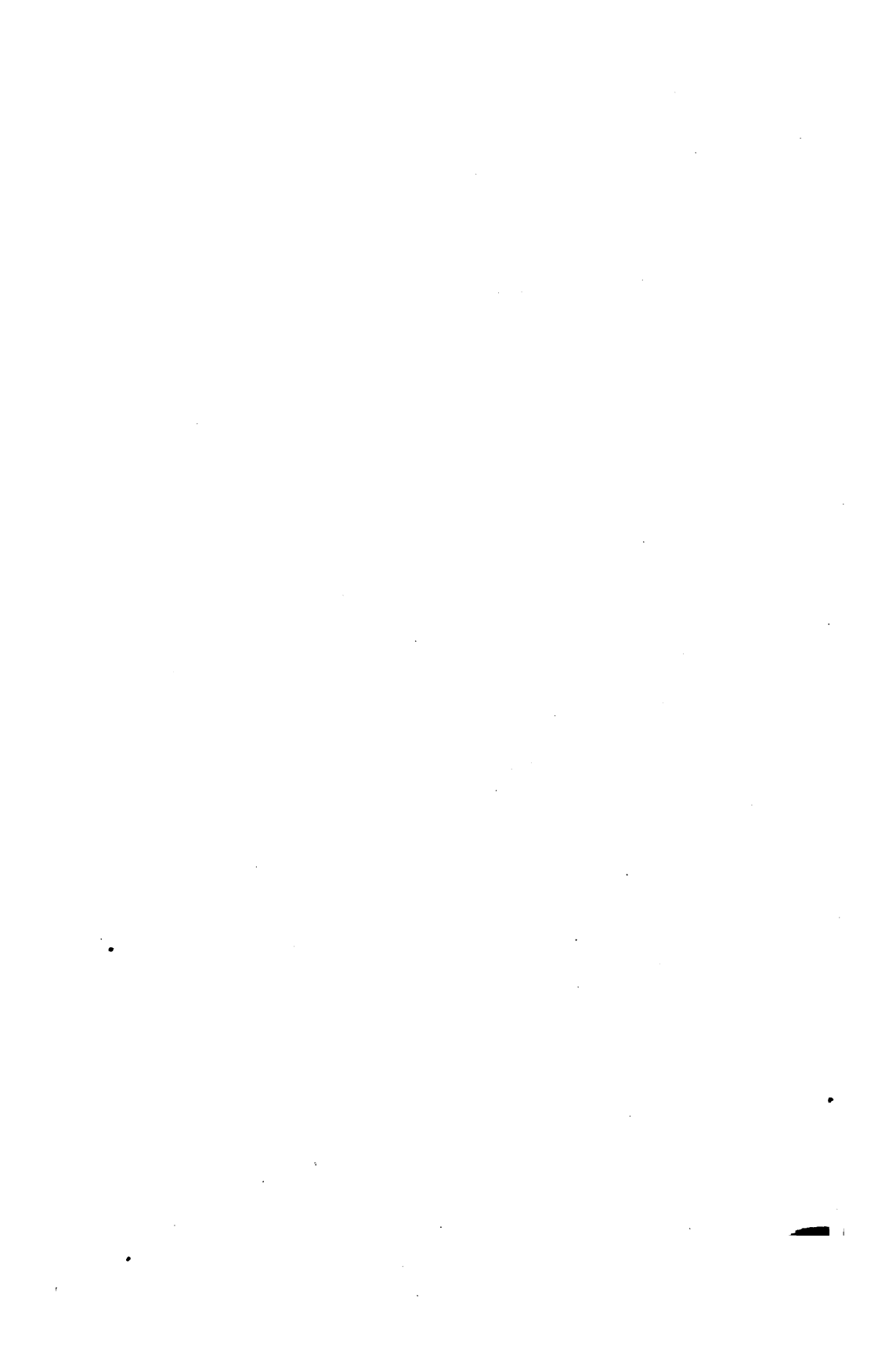
our laws is made, then the State Commissioner of Horticulture should be permitted to divide the state into districts, each with a commissioner to guard its interests. If this district system is adopted, then the combining of the unprotected counties of limited population with a promising future in fruit growing with those counties already having county horticultural commissioners as referred to under the discussion of "County Horticultural Commissioners" could be effected. This would greatly lessen expense, and all counties, even the less populous, would be protected to their own advantage and to the safety of the entire state.

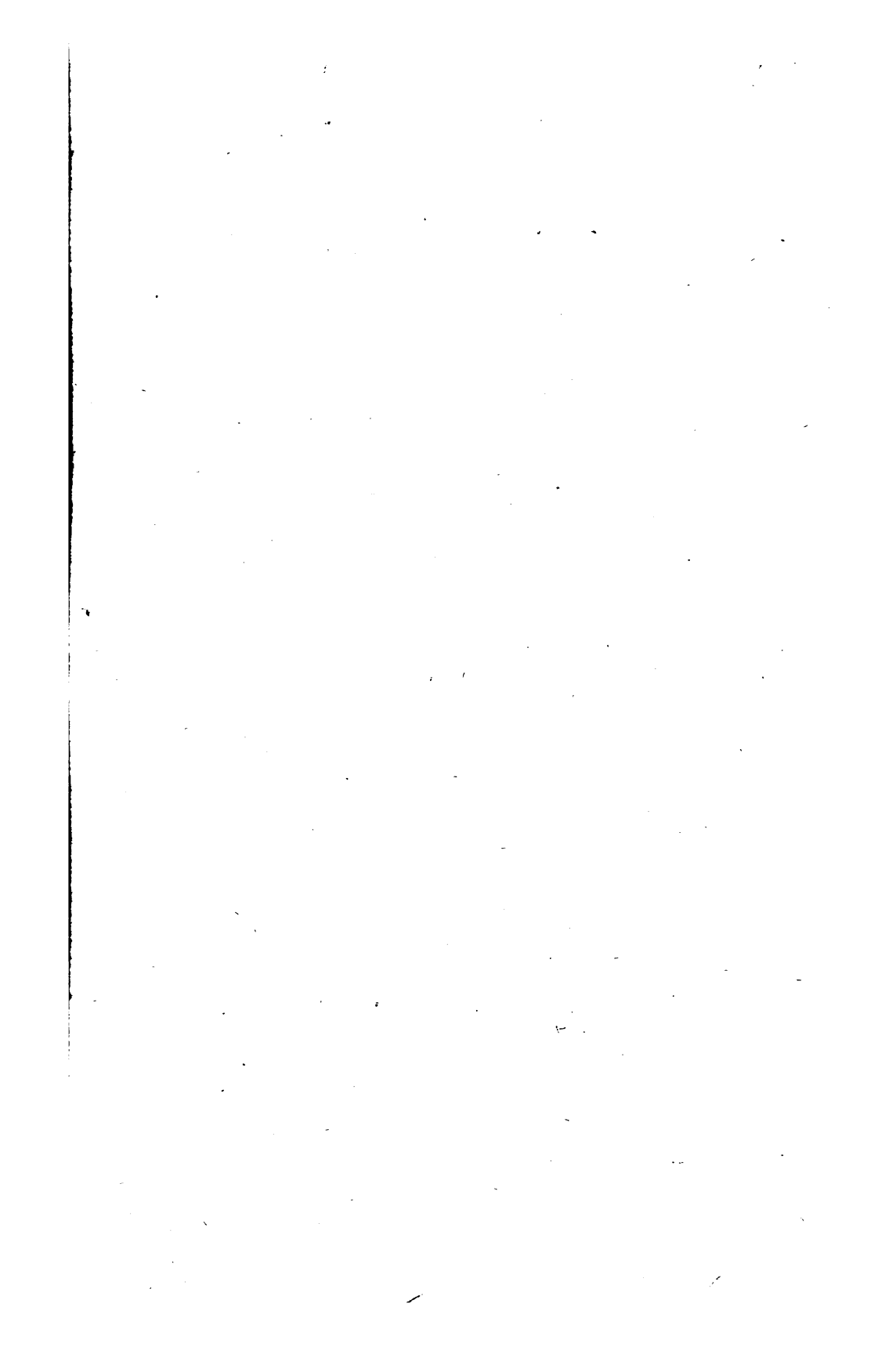
AN AGRICULTURAL DEPARTMENT.

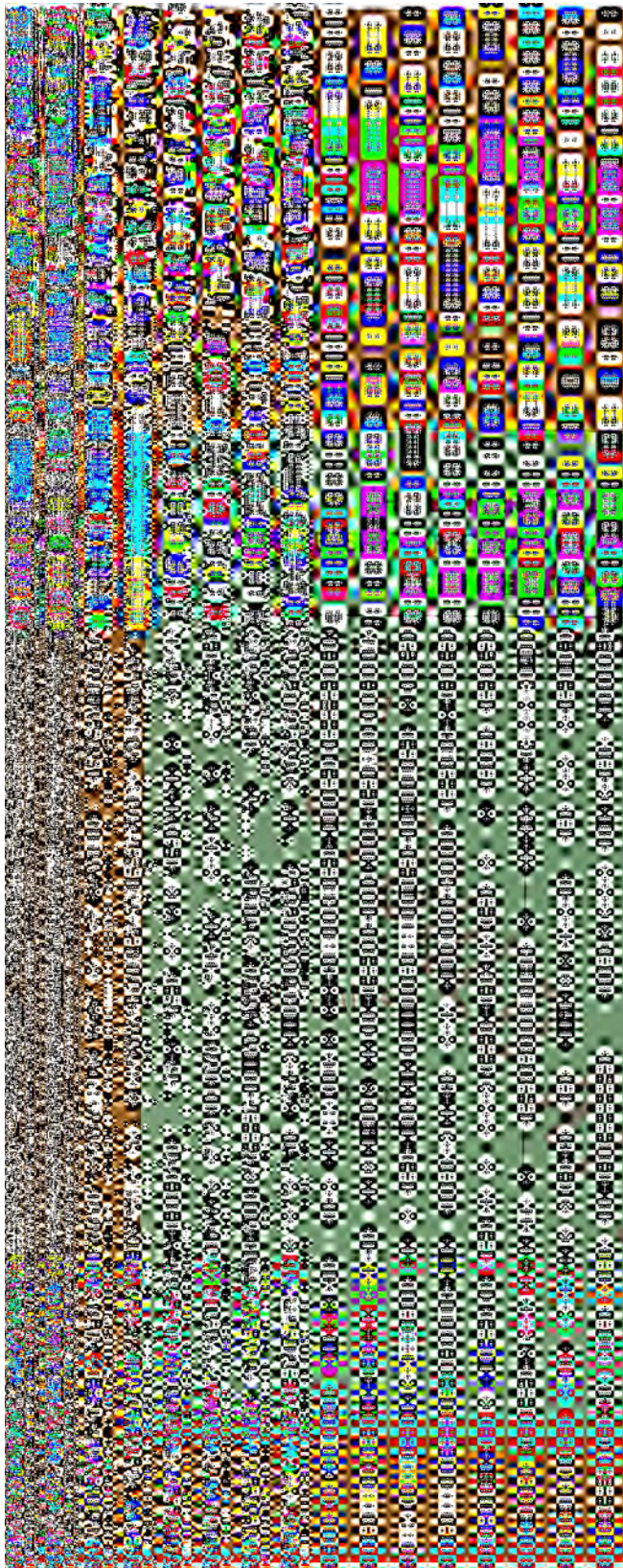
Since assuming the duties of the office of State Commissioner of Horticulture I have felt that economy and efficiency would be served by consolidating all the departments of the state that have to do with agriculture. At the San Jose State Fruit Growers Convention a committee was appointed to consider and recommend desirable legislation. This committee met later and was unanimous in the opinion that consolidation is desirable. At the Davis convention a tentative measure was reported and favored. This was further considered at the recent convention held in Los Angeles, where over thirteen hundred persons registered, and was again endorsed. This committee will present a bill to be considered by your honorable body. I believe that this contemplated action will unify, harmonize and would, as stated above, work for economy and efficiency.

STATE SMELTER WASTE COMMISSION.

At the fortieth session of the California State Legislature a commission was appointed to investigate the problem of smelter waste to determine its effect on vegetation and consequent injury, if injury there be, on agriculture. As one of the three members of this State Smelter Waste Commission no little time has been given by myself and the Chief Deputy State Commissioner of Horticulture to the prosecution of this inquiry. A report of our findings has been submitted to the Governor as directed by the statute providing for the investigation.







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